Memorandum

To: Laurie Niewolny, SWRO WQP

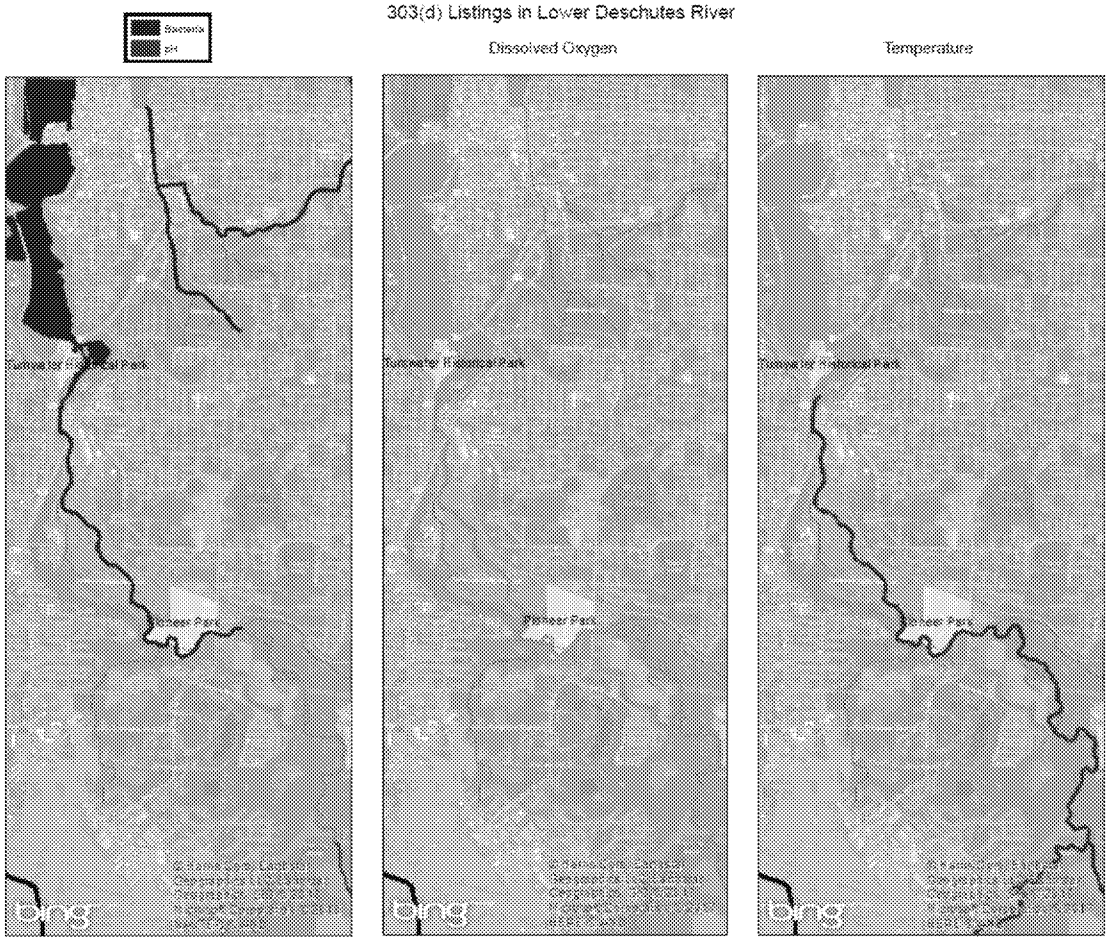
From: Andrew Kolosseus, SWRO WQP

Date: April 19, 2018, updated November 1, 2018 and December 17, 2018

Re: Water Quality Violations in the Deschutes River Related to Proposed Hatchery

The memorandum describes the violations for pH, temperature, dissolved oxygen, fine sediment, and bacteria in the lower Deschutes River. EPA approved an Ecology TMDL for temperature in the Deschutes River in July 2018. At the same time, EPA disapproved Ecology's TMDL submittal for the other parameters; EPA is now writing a TMDL to cover the parameters they disapproved. We do not know how EPA will treat the hatchery in their TMDL.

WDFW is proposing to build a hatchery at Pioneer Park. WDFW is proposing a zero-discharge during June 16 – August 30 (although there are rumors that they may change this proposal if EPA allows a non-zero discharge). There are 303(d) listings for dissolved oxygen, bacteria, and temperature in the Deschutes River at Pioneer Park. The temperature listing is addressed by the 2018 Deschutes TMDL. There are no pH or fine sediment listings at this site (303d listings for pH and fine sediment occur further upstream).



Critical Season in the TMDL

I reviewed the TMDL ([HYPERLINK "https://fortress.wa.gov/ecy/publications/documents/1203008.pdf"]) to determine the critical season it identifies. The Deschutes River critical season for temperature is July through August (page 108).

While EPA may change the critical season in their TMDL for other parameters, the disapproved Ecology TMDL may still be a useful reference. The disapproved Ecology TMDL had a critical season for DO and pH of June through August (page 148). Bacteria must be addressed year-round, as there are violations in both the summer season and the winter season (page 43). Fine sediment is addressed annually (page 46).

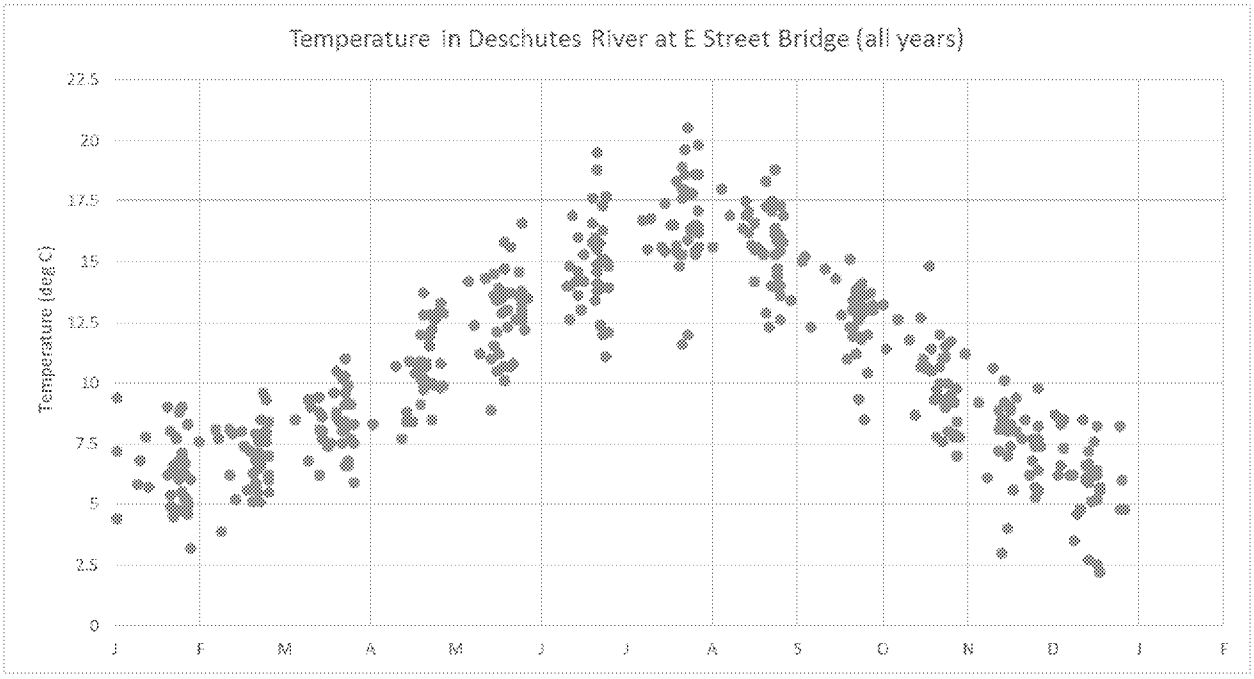
Deschutes River – Data Evaluation[1]

I further explored violations for dissolved oxygen, fecal coliform, temperature, and pH in the Deschutes River by evaluating data at the E Street Bridge. The E Street Bridge crosses the Deschutes River downstream of Pioneer Park and upstream of the Tumwater Historical Park. It is the closest ambient monitoring station, and has monthly grab samples. This same data was analyzed in the 2015 TMDL, but this memo includes data collected after the TMDL was completed.

Temperature

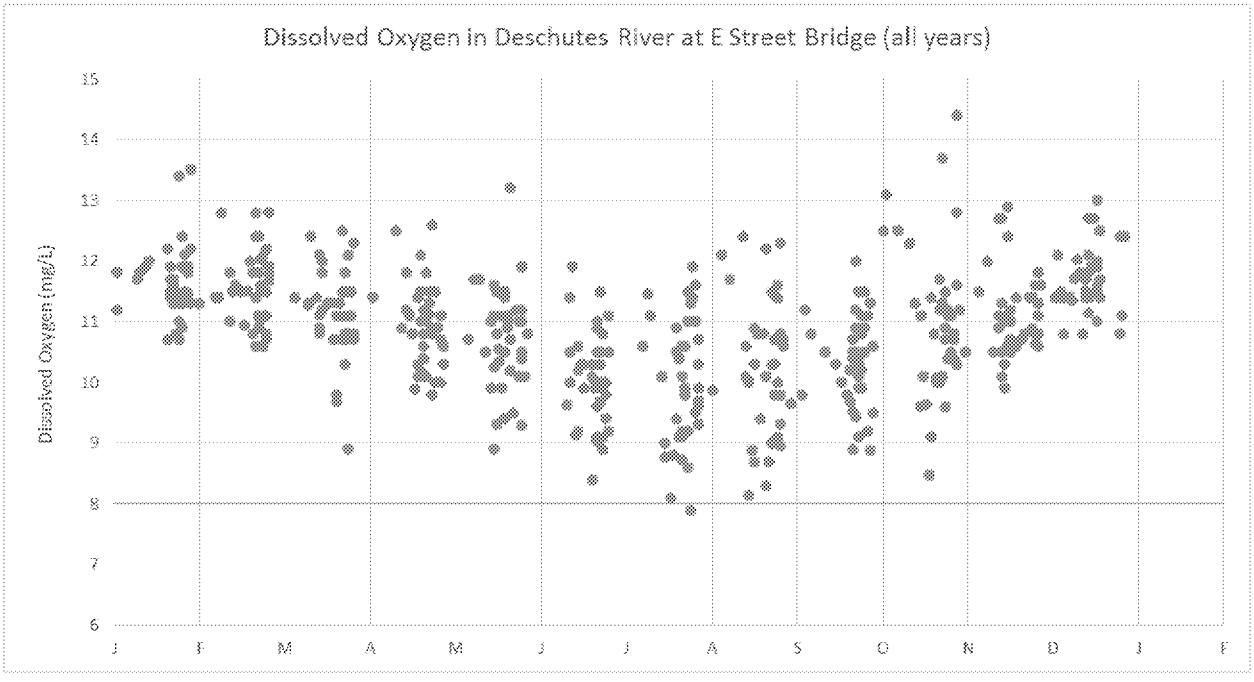
The first figure shows temperature above the 17.5 degree criterion from June 22 through August 26 in multiple years. Outside of this window, there are no violations.

[1] Data was downloaded from EIM. See [HYPERLINK "file:///Z:/My%20Documents/TMDLs/Wagner/Old%20Deschutes%20Budd/data%20at%20E%20street%20bridge.xlsx"] for details.



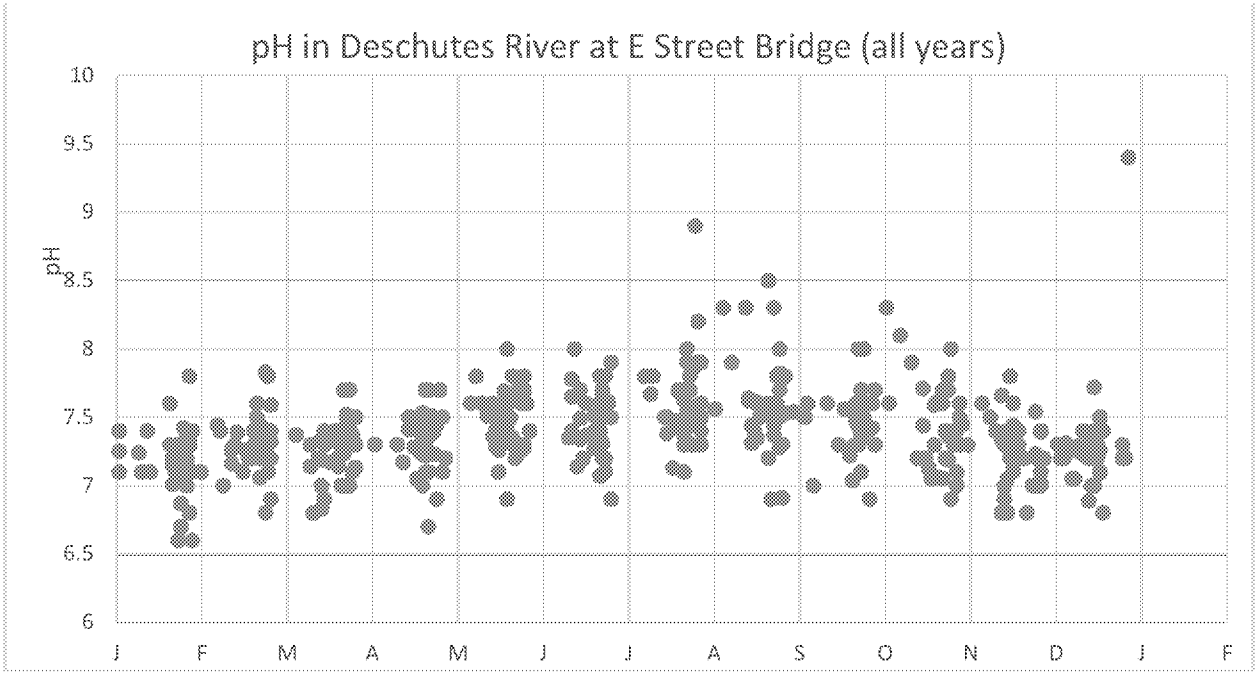
Dissolved Oxygen

The second figure shows dissolved oxygen below (worse than) the 8 mg/L criterion only on July 27th of one year.



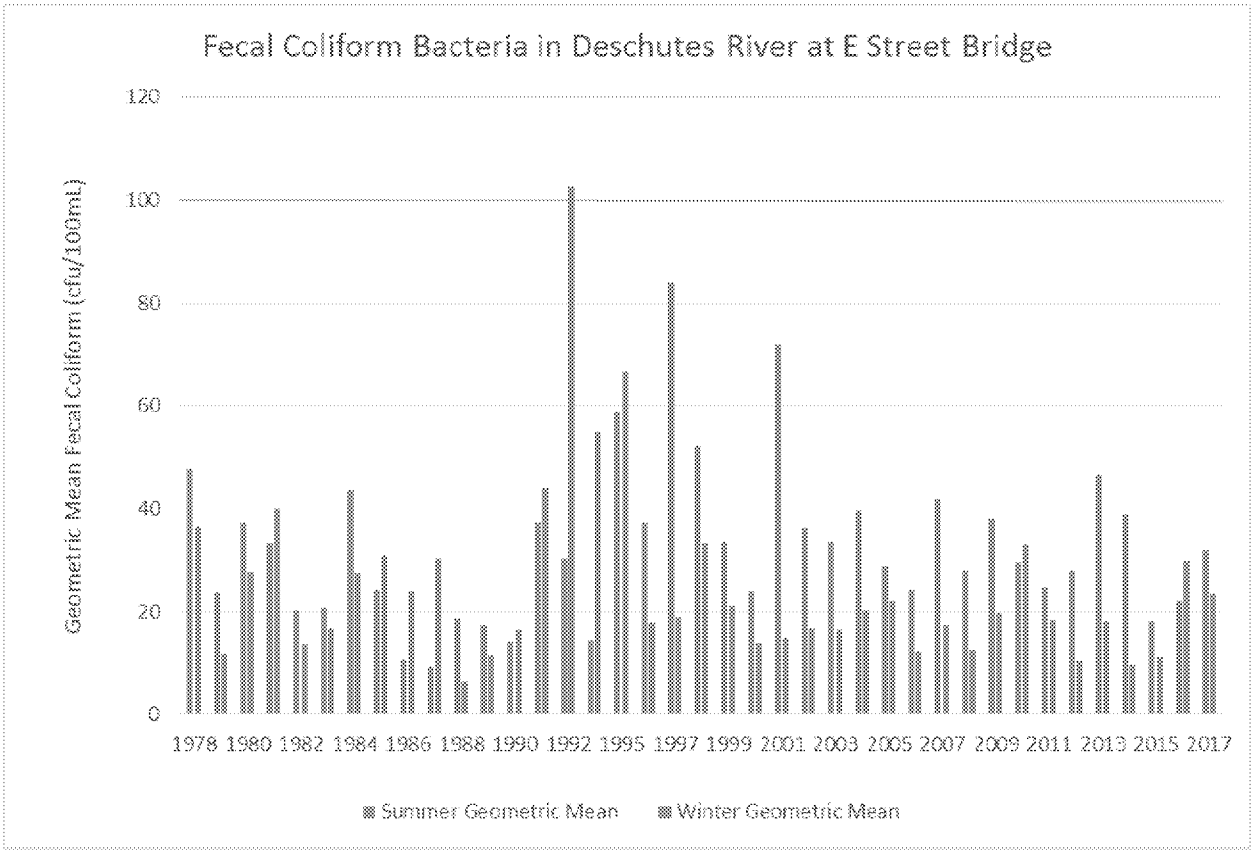
pH

The third figure shows pH outside of the criteria range from July 28 to August 23. The 9.4 pH excursion is likely an anomaly in the data given its deviation from all other data

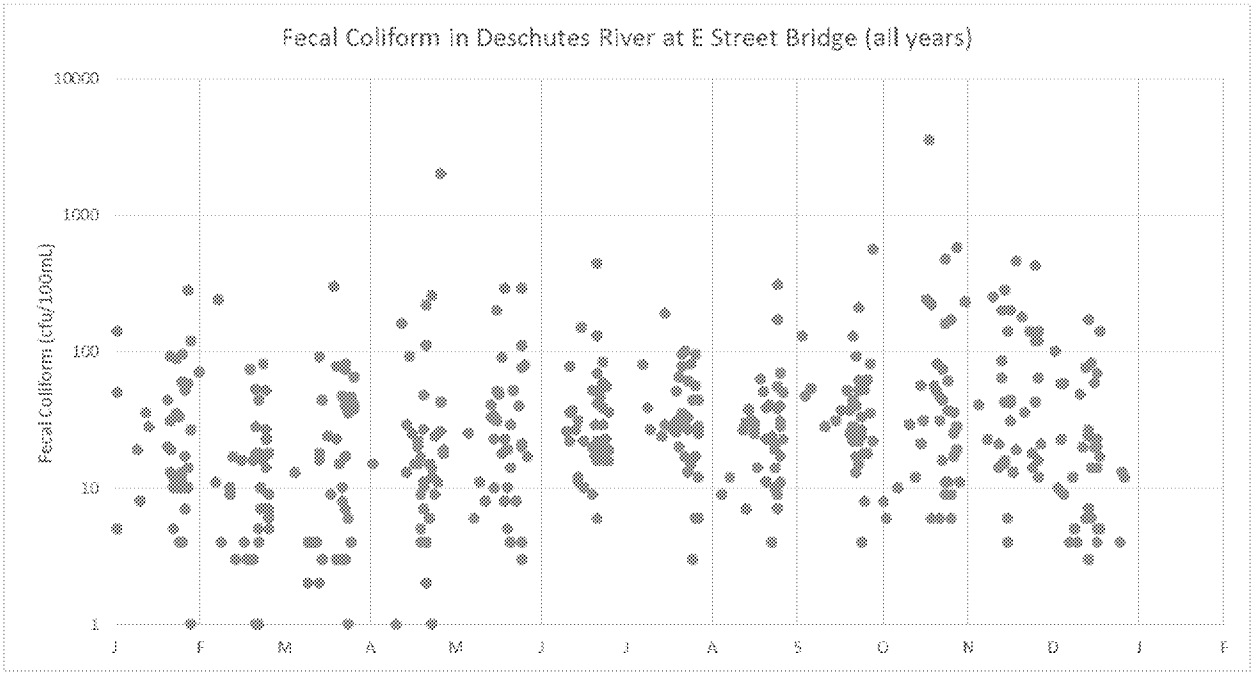


Bacteria

Bacteria is a more complex parameter. It is evaluated over two seasons, May-September and October-April. While there is a 303(d) listing in the lower section of the river, the disapproved Ecology TMDL determined that the water quality standards were met and no reduction in bacteria concentration was needed (page 67). This analysis likewise found the geometric mean criterion was met in both the winter and summer season for all years except 1992. The 303(d) listing (#16722) is based on a violation of the 10% criterion in 2010.



In order to evaluate the proposed WDFW discharge, it is necessary to consider the individual data points. These individual data points are not directly comparable to the water quality standard for the geometric mean and 10% of samples. There are no obvious season patterns, and fecal coliform concentrations were above 100 cfu at all times per year.

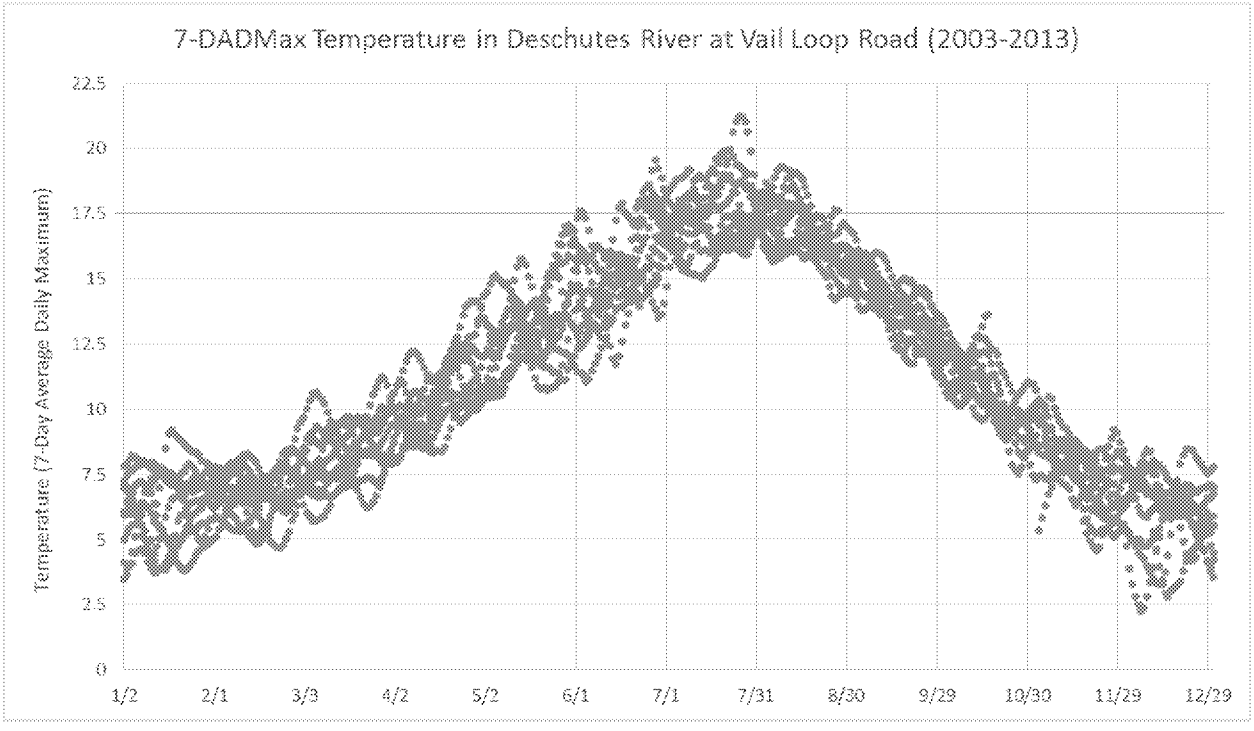


Fine Sediment

Fine sediment data is summarized in the 2015 TMDL. It cited earlier studies that showed fine sediment levels at the Pioneer reach at 22%, well above the 12% target. No additional data was evaluated for this memo.

Continuous Temperature Data

The nearest station with continuous temperature data is the Deschutes River at Vail Loop Road. Unfortunately, this station is at river mile 24.9, considerably upstream of the proposed hatchery. While the river does not warm or cool significantly between Vail Loop Road and Tumwater Falls, the distance does greatly limit the usefulness of this data. However limited in its applicability, the Vail Loop Road station showed violations on June 4 and 5 in one year and numerous violations from June 16 through August 28 in multiple years. The water quality standards allow for one violation every ten years (WAC 173-201A-200(1)(c)(iii).



Conclusion and Possible Steps Forward

Temperature: No violations of the water quality standards occurred from Sept 1 through June 14. If WDFW does not discharge during June 15 through August 31, then they are not causing or contributing to a violation of water quality standards during that time. If they discharge below 17.5 degrees C during the rest of the year, there will not be a violation (and thus they would not be causing or contributing to a violation).

Dissolved Oxygen: No violations occurred from Sept 1 through June 14. If WDFW does not discharge during June 15 through August 31, then they are not causing or contributing to a violation of water quality standards during that time. WDFW should model their effect on dissolved oxygen (nutrient and dissolved oxygen discharge) to show if they would cause a violation during the rest of the year. If there is no violation, then WDFW would not be causing or contributing to a violation.

pH: There is no 303(d) listing for pH at the discharge location. Permit limits for pH should follow normal permitting processes.

Fine Sediment: There is no 303(d) listing for fine sediment at the discharge location. However, potential problems were identified in the TMDL. Permit limits for fine sediment should follow normal permitting processes, with a suggestion to consider a zero net fine sediment load limit for the hatchery.

Bacteria: Fecal coliform discharges should be evaluated for the hatchery as no new discharge may cause or contribute to a violation of water quality standards.

Reminder: The permit must also consider downstream impairments in Budd Inlet and Capitol Lake. This memo does not address these downstream waters.